QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Functions of the Trachea in the Act of Respiration.*—Some interesting observations on this point by Dr. Leven, appear in the just published part of Dr. Brown-Séquard's *Archives de Physiologie.* Dr. Leven remarks that up to the present time most physiologists have regarded the trachea as an inert conduit for the passage of air. Nevertheless, sudden death has occurred on various occasions during the operation of tracheotomy; and fractures of the larynx have frequently induced death, without any exact physiological explanation ever having been advanced. His observations, however, have led him to form certain conclusions to the effect that the trachea is not an inert tube, but that it is intimately associated with the medulla oblongata in its function through the pneumogastric nerves, permitting the passage of air, and therefore, also, the entrance of oxygen, which intermittingly excites the periphery of the pneumogastric nerves, and maintains the medulla oblongata in a constant state of activity. He grounds these conclusions on the facts: 1. That a ligature applied around the trachea which effects a slight constriction of its calibre, instantly retards the respiratory movements. 2. A strong ligature, suddenly applied, so as altogether to occlude the passage of air, stops at once both respiration and circulation; sudden death follows, preceded only by one or two convulsive efforts. 3. It is through the pneumogastric nerves that the impression received by the trachea is conveyed to the medulla. 4. This is proved by the fact that if the pneumogastrics are divided before tying the trachea, the application of the ligature does not produce sudden death. The animal then dies asphyxiated by carbonic acid. 5. Moreover, if after incompletely ligaturing the trachea, the coma of carbonic acid be induced, the respiratory act can still be retarded by tightening the ligature, or may be brought to a sudden stop by occluding the calibre of the tube. 6. These experiments have a direct bearing on various pathological conditions, and upon asphyxia in general, teaching us —7. That we should not confound asphyxia produced by carbonic acid with asphyxia caused by strangulation, nor either of these two with the asphyxia of submersion, since the pathogeny of each is different. 8. Although doubtless the presence of carbonic acid in the blood is superadded as a cause of death, in the asphyxia of strangulation and submersion it is only a subsidiary and secondary cause. 9. Death by hanging is due to compression of the trachea, from the excitation of the pneumogastric, consecutively to irritation of the bulb. 10. Death by drowning is due to the fact that, the trachea no longer receives the oxygen of the air, and hence the pneumogastric is no longer excited; the medulla oblongata consequently remains passive, and life is suspended by the arrest of the circulation and respiration, after the animal has

made three or four respirations, induced by the oxygen still contained in the bronchi. 11. Thus it would appear that the asphyxia produced by hanging and by drowning rather merits the name of syncope, if the distinction between these two clinical terms could be preserved, and if the greater number of supposed cases of asphyxia were not cases of true syncope of a different kind. Asphyxia by hanging is due to an irritation of the bulb; that by drowning to inertia of the bulb.—*Lancet*, March 5, 1870.

2. *Physiology of the Blood.*—In a recent paper by M. SAVOTTI in the *Centralblatt*, he describes a phenomenon of great interest, and hitherto unobserved—the entrance of entire pigment-cells into the channels of the capillaries and smaller veins of the web of the frog's foot through their walls. This is the converse process to that exit of white corpuscles of the blood through the walls of the bloodvessels, which has attracted much attention, and as to which the researches have been brought under the notice of our readers. M. Savotti uses a dilute solution of sulphuric acid—2 per cent. The cells contract and become aggregated around the minute vessels. Then, putting forth processes, one pierces the wall of the vessel and enters its cavity. The whole cell sometimes is slowly drawn in, and after remaining adherent for a time to the wall of the vessel, gradually moves onward with the current of blood. The observation is one of great physiological and pathological interest. It will of course require verification.—*Brit. Med. Journ.*, May 28, 1870.

3. *Regeneration of Nerve-tissue.*—VOIT has recently proved the reproduction of the cerebral tissue in the pigeon, and the coincidence of this reproduction with almost complete renewal of the cephalic functions. MM. Masius and Van Laer, Professors in the University of Liege, deduce from recent experiments—detailed at length in the current number of the *Monthly Microscopical Journal*—that the spinal cord in the frog can recover rapidly a loss of substance which has taken place in its own tissues, and repair its primitive anatomical and physiological properties.—*Brit. Med. Journ.*, May 7, 1870.

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

4. *Physiological Action of Hydrate of Chloral.*—An extensive series of experiments have been instituted by the Medical Officers of the Royal Infirmary, Edinburgh, for the purpose of determining this point; and the conclusion at which they arrived is, that in healthy persons, even after a good night's rest, if the drug be given in doses of twenty to twenty-five grains, in the majority of instances, a condition allied to natural sleep is produced, accompanied by no injurious effects, provided they remain quiet and undisturbed in bed. On the other hand, if moving about, exposed to excitement, or carrying on their usual duties, the same dose, while it occasionally produces a giddy or even slight drowsy sensation, rarely induces a special desire for sleep.—*British Med. Journ.*, April 30, 1870.

Dr. A. M. ADAMS asserts (*Glasgow Med. Jour.*, May, 1870), that chloral lowers the action of the heart and reduces the temperature of the body when such action and temperature are above the standard of health, but in cases of feeble circulation he has found it to act as a gentle stimulant, restoring and equalizing the circulation throughout the outer surfaces of the body and extremities. The breathing is quickened for the first two hours, or thereabouts, after the successful administration of chloral, but it soon falls to what we are accustomed to see in natural sleep. The sleep of chloral is more allied to nature than that induced by any other drug, and comes on with much greater speed and certainty.

Dr. WM. A. HAMMOND regards it as conclusively shown by his experiments on